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EXAMINER

PÖE, MICHAEL I

ART UNIT

PAPER NUMBER

1732

DATE MAILED: 10/31/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

7 KB

Office Action Summary

Application No.

09/600,343

Applicant(s)

JOHANSSON ET AL.

Examiner

Michael I Poe

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 July 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 July 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- ☐ Interview Summary (PTO-413) Paper No(s). _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other:

DETAILED ACTION

Amendments

1. Applicant's amendment A filed on July 14, 2000 has been entered. Based upon the entry of this amendment, existing claims 1-11 have been amended, no existing claims have been canceled, and no new claims have been added. Claims 1-11 are currently pending.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

3. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

In the instant case, the abstract is two paragraphs rather than a single paragraph and includes phrases that can be implied (e.g., "The invention provides"). The abstract should be amended in response to this Office action to correct these problems.

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Claim Objections

4. Claims 1-11 are objected to because of the following informalities: (1) the "." after "cement" should be deleted on line 7 of claim 1; (2) "find" should be "fine" on line 9 of claim 2; (3) "lease" should be "least" on line 4 of claim 7; and (4) "and a" should be deleted after "10,000" on line 12 of claim 8. Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 2, 4 and 7-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 includes the recitation "escaping air entraining cement and the find particulate material, if any, into the cavities, where sedimentation and hydration take place". This recitation is generally confusing because there appears to be word(s) missing in the recitation. For the purpose of this Office action, the examiner has assumed based upon the applicant's original disclosure that the applicant is attempting to claim that existing air bubbles collapse when the aerated concrete is pressed further into the cavities such that air escaping from the air bubbles entrains the cement and the fine particulate material, if any, into the cavities to thereby cause sedimentation and hydration to take place.

Claim 4 includes the formula $(R)_m - R_1 - (SO_3M)_2$. This formula is confusing because the applicant hasn't defined "m" in the remainder of the claim. Based on the applicant's original disclosure, the examiner has assumed for the purpose of this Office action that m is a number 1 or 2.

Claims 7 and 8 are confusing because they include conflicting recitations. Claim 7 includes the recitation "2-10% based on weight of the cement, of a fine-particulate material with a particle size smaller than that of the cement". Claim 8 includes the recitation "0-10 parts by weight of a fine-particulate material with a particle size smaller than that of the cement". Since independent claim 7 requires at least

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2% of the fine-particulate material to be present, dependent claim 8 can not allow 0 parts or less than 2% of the fine-particulate material, as currently claimed, without directly conflicting with independent claim 7. For the purpose of this Office action, the examiner has assumed that 2-10% of the fine-particulate material is present.

Claim 8 includes two different composition ranges for water, specifically 35-80 parts by weight and 50-70 parts by weight. It would be unclear to one reading the claims which composition range that the applicant intends to claim in claim 8; therefore, claim 8 is confusing. For the purpose of this Office action, the examiner has assumed that the applicant intended to claim the broader range of 35-80 parts by weight.

Double Patenting

7. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

8. Claims 1, 4 and 6 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 8 and 14 of U.S. Patent No. 6,022,407 in view of U.S. Patent No. 4,514,112 (Sano et al.).

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Claims 1 and 4

The claims of U.S. Patent No. 6,022,407 teach a pumpable aqueous concrete mixture (a pumpable, low-viscous concrete, which is based on an aqueous dispersion of cement) having an air pore volume of 10-85 percent comprising water (a pore volume of at least 20% by volume), cement and an anionic surface-active compound, the concrete mixture having a water to cement ratio from 0.40 to 0.80 and the anionic surface-active compound being a compound of the formula $(R)_m - R_1 - (SO_3M)_2$ wherein R is an aliphatic group having 4-20 carbon atoms, m is a number 1 or 2, the sum of the number of carbon atoms in the 1 or 2 R groups being 6-30, R₁ is an aromatic group containing at least 2 aromatic rings and 10-20 carbon atoms, and M is a cation or hydrogen (claims 1, 8 and 14).

Although the claims of U.S. Patent No. 6,022,407 teach the basic pumpable, low viscous concrete composition of the instant invention, the claims of U.S. Patent No. 6,022,407 do not specifically teach how that composition is used (e.g., the process according to claims 1 and 6). However, Sano et al. teach a method for improving the ground or foundation (a method of stabilizing gravel, sand crushed stone, rock and concrete structures which are cracked, porous or have other cavities difficult to access) by injecting a grouting agent therein via a hollow injection rod (by injecting a pumpable, low-viscous concrete, which is based on an aqueous dispersion of cement; injecting concrete into the cavities that are difficult to access and are to be sealed) to prevent water permeability (and sealing the same against flows of water) including injecting a grouting agent under a controlled injection pressure by keeping a discharge rate of the grouting agent at a low value until some initial infiltration region is formed in the ground around the hollow injection rod (said concrete being first injected at a low pressure wherein the aerated concrete remains intact) and injecting the grouting agent under a controlled higher pressure by changing the discharge rate of the grouting agent continuously or stepwise after the formation of the initial infiltration region so that further injection outside the initial infiltration region occurs (the concrete being then exerted to an increased pressure, whereby the aerated concrete located in or in the vicinity of the cavities are pressured further into the cavities) (abstract; column 1, lines 8-25; column 3, lines 18-34; column 4, lines 57-63). It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made and one of ordinary skill would have been motivated to use the composition of the claims of

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U.S. Patent No. 6,022,407 in the process of Sano et al. to provide a process for stably and uniformly injecting pumpable aerated concrete into ground having complicated structure and properties (see specifically column 4, lines 24-28 of Sano et al.).

Claim 6

The discussion of the claims of U.S. Patent No. 6,022,407 and Sano et al. as applied to claim 1 above applies herein.

The claims of U.S. Patent No. 6,022,407 in view of Sano et al. do not specifically teach that the injection of the concrete occurs at a pressure below 3 bars and that the pressure is then increased to at least 6 bars. In regard to injection pressures, Sano et al. further teach that the injection pressure should be controlled based on values of tensile strength and the water coefficient of the ground determined in advance experimentally with the use of a test ground or the injection pressure can be obtained experimentally by an appropriate equation (column 3, lines 47-53). As such, Sano et al. recognizes that the injection pressures are result-effective variables. Since the injections pressures are result-effective variables as recognized by Sano et al., one of ordinary skill in the art would have obviously determined the optimum injection pressures through routine experimentation based on the tensile strength and the water coefficient of a test ground.

9. Claims 3 and 5 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 8 and 14 of U.S. Patent No. 6,022,407 in view of U.S. Patent No. 4,514,112 (Sano et al.) and U.S. Patent No. 4,466,833 (Spangle).

Claims 3 and 5

The discussion of the claims of U.S. Patent No. 6,022,407 and Sano et al. as applied to claim 1 above applies herein.

Although the claims of U.S. Patent No. 6,022,407 in view of Sano et al. do teach that the aerated concrete has an air pore volume of 40-85%, the claims of U.S. Patent No. 6,022,407 in view of Sano et al. do not specifically teach that the aerated concrete is hydrophobic and is not spontaneously miscible with water. However, Spangle teaches a lightweight cement slurry having a gas portion that comprises, by volume, about 20 percent to about 55 percent of the foamed slurry (an air pore volume of 40-85%) and

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may further include thickeners such as bentonite, accelerators, or retarders (column 5, lines 10-13). One of ordinary skill in the art would have recognized that the inclusion of bentonite in the aerated concrete would have obviously made the aerated concrete hydrophobic and not spontaneously miscible with water. It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made and one of ordinary skill would have been motivated to use bentonite as a thickener, accelerators and/or retarders in the process of the claims of U.S. Patent No. 6,022,407 in view of Sano et al. as taught by Spangle to thereby improve the pumpability of the aerated concrete, to increase the early strength of the aerated concrete and/or to delay the setting of the aerated concrete, respectively, in the process of the claims of U.S. Patent No. 6,022,407 in view of Sano et al.

10. Claims 7-11 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 4, 8, 11, 12, 14 and 15 of U.S. Patent No. 6,022,407 in view of U.S. Patent No. 5,820,670 (Chatterji et al.) and U.S. Patent No. 4,168,985 (Kolar et al.).

Claims 7-11

The claims of U.S. Patent No. 6,022,407 teach a pumpable aqueous concrete mixture (aerated concrete) having an air pore volume of 10-85 percent (having a pore volume of at least 20%; an air pore volume of at least 40-85%) comprising water, cement, a resin present in an amount of 0-250% based on the weight of the anionic compound (0.1-2.5 parts by weight of resin; 0-2.5 parts by weight of a resin having a molecular weight below 10,000) and an anionic surface-active compound present in an amount of 0.005-1 parts by weight (0.1-1 parts by weight of a dispersing agent), the concrete mixture having a water to cement ratio from 0.40 to 0.80 (35-80 parts by weight of water) and the anionic surface-active compound being a compound of the formula $(R)_m - R_1 - (SO_3M)_2$ wherein R is an aliphatic group having 4-20 carbon atoms, m is a number 1 or 2, the sum of the number of carbon atoms in the 1 or 2 R groups being 6-30, R₁ is an aromatic group containing at least 2 aromatic rings and 10-20 carbon atoms, and M is a cation or hydrogen (claims 1, 4, 8, 11, 12, 14 and 15). With regard to claim 8, the accelerator, retarder, thickening agent and swelling agents may be considered optional components because they are not required in the claimed composition (e.g., 0 parts).

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The claims of U.S. Patent No. 6,022,407 do not specifically teach that the cement has a particle distribution whereby at least 95% pass a screen with a mesh size of 32 or 64 μm . However, Kolar et al. teach that commonly known cement mixtures exhibit highest strengths at grain size up to 30 μm (finely-ground cement with a particle distribution wherein at least 95% pass a screen with a mesh size of 32 or 64 μm) (column 2, lines 19-21). It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made and one of ordinary skill would have been motivated to use cement having the claimed particle distribution in the composition of the claims of U.S. Patent No. 6,022,407 as taught by Kolar et al. to provide a composition that exhibits highest strengths as taught by Kolar et al.

The claims of U.S. Patent No. 6,022,407 further do not specifically teach that the aerated concrete includes 2-10% based on the weight of the cement of a fine-particulate material with a particle size smaller than that of the cement. However, Chatterji et al. teach a resilient well cement composition including fumed silica of a fine particle size in an amount range of from about 5% to about 30% by weight of the cement in the composition (2-10% based on the weight of the cement, of a fine-particulate material with a particle size smaller than that of the cement; 0-10 parts by weight of a fine-particulate material with a particle size smaller than that of the cement) (column 4, lines 21-42). It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made and one of ordinary skill would have been motivated to include a fine-particulate material in the composition of the claims of U.S. Patent No. 6,022,407 as taught by Chatterji et al. as a permeability reducer to thereby reduce the water permeability of the cured aerated concrete.

11. Claims 1 and 3-11 are directed to an invention not patentably distinct from claims 1, 4, 8, 11, 12, 14 and 15 of commonly assigned U.S. Patent No. 6,022,407. Specifically, claims 1 and 3-11 are not patentably distinct for the reasons set forth above in the rejections over the judicially created doctrine of obviousness-type double patenting.

The U.S. Patent and Trademark Office normally will not institute an interference between applications or a patent and an application of common ownership (see MPEP § 2302). Commonly assigned U.S. Patent No. 6,022,407, discussed above, would form the basis for a rejection of the noted claims under 35 U.S.C. 103(a) if the commonly assigned case qualifies as prior art under 35 U.S.C. 102(f)

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or (g) and the conflicting inventions were not commonly owned at the time the invention in this application was made. In order for the examiner to resolve this issue, the assignee is required under 35 U.S.C. 103(c) and 37 CFR 1.78(c) to either show that the conflicting inventions were commonly owned at the time the invention in this application was made or to name the prior inventor of the conflicting subject matter. Failure to comply with this requirement will result in a holding of abandonment of the application.

A showing that the inventions were commonly owned at the time the invention in this application was made will preclude a rejection under 35 U.S.C. 103(a) based upon the commonly assigned case as a reference under 35 U.S.C. 102(f) or (g), or 35 U.S.C. 102(e) for applications filed on or after November 29, 1999.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 1, 4 and 6 are rejected under 35 U.S.C. 103(a) as being obvious over U.S. Patent No. 4,514,112 (Sano et al.) in view of U.S. Patent No. 6,022,407.

The applied reference, U.S. Patent No. 6,022,407, has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C.

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104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). For applications filed on or after November 29, 1999, this rejection might also be overcome by showing that the subject matter of the reference and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. See MPEP § 706.02(I)(1) and § 706.02(I)(2).

Claims 1 and 4

Sano et al. teach a method for improving the ground or foundation (a method of stabilizing gravel, sand crushed stone, rock and concrete structures which are cracked, porous or have other cavities difficult to access) by injecting a grouting agent therein via a hollow injection rod (by injecting a pumpable, low-viscous concrete, which is based on an aqueous dispersion of cement; injecting concrete into the cavities that are difficult to access and are to be sealed) to prevent water permeability (and sealing the same against flows of water) including injecting a grouting agent under a controlled injection pressure by keeping a discharge rate of the grouting agent at a low value until some initial infiltration region is formed in the ground around the hollow injection rod (said concrete being first injected at a low pressure wherein the aerated concrete remains intact) and injecting the grouting agent under a controlled higher pressure by changing the discharge rate of the grouting agent continuously or stepwise after the formation of the initial infiltration region so that further injection outside the initial infiltration region occurs (the concrete being then exerted to an increased pressure, whereby the aerated concrete located in or in the vicinity of the cavities are pressured further into the cavities) (abstract; column 1, lines 8-25; column 3, lines 18-34; column 4, lines 57-63).

Although Sano et al. teach the basic claimed process, Sano et al. do not teach the claimed concrete composition. Specifically, Sano et al. do not teach that the concrete is aerated, that the concrete has a pore volume of at least 20% by volume, and the dispersant agent of claim 4. However, U.S. Patent No. 6,022,407 teach a pumpable aqueous concrete mixture (a pumpable, low-viscous concrete, which is based on an aqueous dispersion of cement) having an air pore volume of 10-85 percent comprising water (a pore volume of at least 20% by volume), cement and an anionic surface-active compound, the concrete mixture having a water to cement ratio from 0.40 to 0.80 and the anionic

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surface-active compound being a compound of the formula $(R)_m - R_1 - (SO_3M)_2$ wherein R is an aliphatic group having 4-20 carbon atoms, m is a number 1 or 2, the sum of the number of carbon atoms in the 1 or 2 R groups being 6-30, R₁ is an aromatic group containing at least 2 aromatic rings and 10-20 carbon atoms, and M is a cation or hydrogen (claims 1, 8 and 14). It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made and one of ordinary skill would have been motivated to use the aerated concrete composition taught by U.S. Patent No. 6,022,407 in the process of Sano et al. to thereby use a concrete mixture having improved homogeneity (see abstract of U.S. Patent No. 6,022,407).

Claim 6

The discussion of U.S. Patent No. 6,022,407 and Sano et al. as applied to claim 1 above applies herein.

Sano et al. in view of U.S. Patent No. 6,022,407 do not specifically teach that the injection of the concrete occurs at a pressure below 3 bars and that the pressure is then increased to at least 6 bars. In regard to injection pressures, Sano et al. further teach that the injection pressure should be controlled based on values of tensile strength and the water coefficient of the ground determined in advance experimentally with the use of a test ground or the injection pressure can be obtained experimentally by an appropriate equation (column 3, lines 47-53). As such, Sano et al. recognizes that the injection pressures are result-effective variables. Since the injections pressures are result-effective variables as recognized by Sano et al., one of ordinary skill in the art would have obviously determined the optimum injection pressures in the process of Sano et al. in view of U.S. Patent No. 6,022,407 through routine experimentation based on the tensile strength and the water coefficient of a test ground.

14. Claims 3 and 5 are rejected under 35 U.S.C. 103(a) as being obvious over U.S. Patent No. 4,514,112 (Sano et al.) in view of U.S. Patent No. 6,022,407 and U.S. Patent No. 4,466,833 (Spangle).

The applied reference, U.S. Patent No. 6,022,407, has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the

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inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). For applications filed on or after November 29, 1999, this rejection might also be overcome by showing that the subject matter of the reference and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. See MPEP § 706.02(l)(1) and § 706.02(l)(2).

Claims 3 and 5

The discussion of the claims of U.S. Patent No. 6,022,407 and Sano et al. as applied to claim 1 above applies herein.

Although Sano et al. in view of U.S. Patent No. 6,022,407 do teach that the aerated concrete has an air pore volume of 40-85%, Sano et al. in view of U.S. Patent No. 6,022,407 do not specifically teach that the aerated concrete is hydrophobic and is not spontaneously miscible with water. However, Spangle teaches a lightweight cement slurry having a gas portion that comprises, by volume, about 20 percent to about 55 percent of the foamed slurry (an air pore volume of 40-85%) and may further include thickeners such as bentonite, accelerators, or retarders (column 5, lines 10-13). One of ordinary skill in the art would have recognized that the inclusion of bentonite in the aerated concrete would have obviously made the aerated concrete hydrophobic and not spontaneously miscible with water. It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made and one of ordinary skill would have been motivated to use bentonite as a thickener, accelerators and/or retarders in the process of Sano et al. in view of U.S. Patent No. 6,022,407 as taught by Spangle to thereby improve the pumpability of the aerated concrete, to increase the early strength of the aerated concrete and/or to delay the setting of the aerated concrete, respectively, in the process of Sano et al. in view of U.S. Patent No. 6,022,407.

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15. Claims 7-11 are rejected under 35 U.S.C. 103(a) as being obvious over U.S. Patent No. 6,022,407 in view of U.S. Patent No. 5,820,670 (Chatterji et al.) and U.S. Patent No. 4,168,985 (Kolar et al.).

The applied reference, U.S. Patent No. 6,022,407, has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). For applications filed on or after November 29, 1999, this rejection might also be overcome by showing that the subject matter of the reference and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. See MPEP § 706.02(I)(1) and § 706.02(I)(2).

Claims 7-11

U.S. Patent No. 6,022,407 teach a pumpable aqueous concrete mixture (aerated concrete) having an air pore volume of 10-85 percent (having a pore volume of at least 20%; an air pore volume of at least 40-85%) comprising water, cement, a resin present in an amount of 0-250% based on the weight of the anionic compound (0.1-2.5 parts by weight of resin; 0-2.5 parts by weight of a resin having a molecular weight below 10,000) and an anionic surface-active compound present in an amount of 0.005-1 parts by weight (0.1-1 parts by weight of a dispersing agent), the concrete mixture having a water to cement ratio from 0.40 to 0.80 (35-80 parts by weight of water) and the anionic surface-active compound being a compound of the formula $(R)_m - R_1 - (SO_3M)_2$ wherein R is an aliphatic group having 4-20 carbon atoms, m is a number 1 or 2, the sum of the number of carbon atoms in the 1 or 2 R groups being 6-30,

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R1 is an aromatic group containing at least 2 aromatic rings and 10-20 carbon atoms, and M is a cation or hydrogen (claims 1, 4, 8, 11, 12, 14 and 15). With regard to claim 8, the accelerator, retarder, thickening agent and swelling agents may be considered optional components because they are not required in the claimed composition (e.g., 0 parts).

U.S. Patent No. 6,022,407 do not specifically teach that the cement has a particle distribution whereby at least 95% pass a screen with a mesh size of 32 or 64 μm . However, Kolar et al. teach that commonly known cement mixtures exhibit highest strengths at grain size up to 30 μm (finely-ground cement with a particle distribution wherein at least 95% pass a screen with a mesh size of 32 or 64 μm) (column 2, lines 19-21). It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made and one of ordinary skill would have been motivated to use cement having the claimed particle distribution in the composition of U.S. Patent No. 6,022,407 as taught by Kolar et al. to provide a composition that exhibits highest strengths as taught by Kolar et al.

U.S. Patent No. 6,022,407 further do not specifically teach that the aerated concrete includes 2-10% based on the weight of the cement of a fine-particulate material with a particle size smaller than that of the cement. However, Chatterji et al. teach a resilient well cement composition including fumed silica of a fine particle size in an amount range of from about 5% to about 30% by weight of the cement in the composition (2-10% based on the weight of the cement, of a fine-particulate material with a particle size smaller than that of the cement; 0-10 parts by weight of a fine-particulate material with a particle size smaller than that of the cement) (column 4, lines 21-42). It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made and one of ordinary skill would have been motivated to include a fine-particulate material in the composition of U.S. Patent No. 6,022,407 as taught by Chatterji et al. as a permeability reducer to thereby reduce the water permeability of the cured aerated concrete.

16. Claims 1, 3, 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,514,112 (Sano et al.) in view of U.S. Patent No. 4,466,833 (Spangle).

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Claims 1, 3 and 5

Sano et al. teach a method for improving the ground or foundation (a method of stabilizing gravel, sand crushed stone, rock and concrete structures which are cracked, porous or have other cavities difficult to access) by injecting a grouting agent therein via a hollow injection rod (by injecting a pumpable, low-viscous concrete, which is based on an aqueous dispersion of cement; injecting concrete into the cavities that are difficult to access and are to be sealed) to prevent water permeability (and sealing the same against flows of water) including injecting a grouting agent under a controlled injection pressure by keeping a discharge rate of the grouting agent at a low value until some initial infiltration region is formed in the ground around the hollow injection rod (said concrete being first injected at a low pressure wherein the aerated concrete remains intact) and injecting the grouting agent under a controlled higher pressure by changing the discharge rate of the grouting agent continuously or stepwise after the formation of the initial infiltration region so that further injection outside the initial infiltration region occurs (the concrete being then exerted to an increased pressure, whereby the aerated concrete located in or in the vicinity of the cavities are pressured further into the cavities) (abstract; column 1, lines 8-25; column 3, lines 18-34; column 4, lines 57-63).

Although Sano et al. teach the basic claimed process, Sano et al. do not specifically teach the claimed concrete composition. Specifically, Sano et al. do not teach that the concrete is aerated, that the concrete has a pore volume of at least 20% by volume or 40-85% by volume, and that the aerated concrete is hydrophobic and is not spontaneously miscible with water. However, Spangle teaches a lightweight cement slurry having a gas portion (aerated concrete) that comprises, by volume, about 20 percent to about 55 percent of the foamed slurry (a pore volume of at least 20% by volume; an air pore volume of 40-85%) and may further include thickeners such as bentonite, accelerators, or retarders (column 5, lines 10-13). One of ordinary skill in the art would have recognized that the inclusion of bentonite in the aerated concrete would have obviously made the aerated concrete hydrophobic and not spontaneously miscible with water. It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made and one of ordinary skill would have been motivated to use aerated concrete composition including bentonite as a thickener, accelerators and/or retarders in the

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process of Sano et al. as taught by Spangle to thereby improve the pumpability of the aerated concrete, to increase the early strength of the aerated concrete and/or to delay the setting of the aerated concrete, respectively, in the process of Sano et al.

Claim 6

The discussion of Sano et al. and Spangle as applied to claim 1 above applies herein.

Sano et al. in view of Spangle do not specifically teach that the injection of the concrete occurs at a pressure below 3 bars and that the pressure is then increased to at least 6 bars. In regard to injection pressures, Sano et al. further teach that the injection pressure should be controlled based on values of tensile strength and the water coefficient of the ground determined in advance experimentally with the use of a test ground or the injection pressure can be obtained experimentally by an appropriate equation (column 3, lines 47-53). As such, Sano et al. recognizes that the injection pressures are result-effective variables. Since the injections pressures are result-effective variables as recognized by Sano et al., one of ordinary skill in the art would have obviously determined the optimum injection pressures in the process of Sano et al. in view of Spangle through routine experimentation based on the tensile strength and the water coefficient of a test ground.

17. Claims 7, 8, 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,820,670 (Chatterji et al.) in view of U.S. Patent No. 4,168,985 (Kolar et al.) and U.S. Patent No. 4,466,833 (Spangle).

Claims 7, 8, 10 and 11

Chatterji et al. teach a resilient well cement composition comprising a hydraulic cement (aerated concrete contains finely-ground concrete), fumed silica of a fine particle size in an amount range of from about 5% to about 30% by weight of the cement in the composition (2-10% based on the weight of the cement, of a fine-particulate material with a particle size smaller than that of the cement; 0-10 parts by weight of a fine-particulate material with a particle size smaller than that of the cement), water in an amount in the range of about 22% to about 95% by weight of cement (35-80 parts by weight of water), a dispersing agent in an amount of 0.5% by weight of cement (0.1-1 parts by weight of a dispersing agent), and an aqueous latex in an amount in the range of about 2.5% to about 45% by weight of cement (0-2.5

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parts by weight of a resin having a molecular weight below 10,000; 0.1-2.5 parts by weight of the resin) (column 4, lines 6-20 and 21-42; column 5, lines 24-30; column 6, lines 54-62; Table 1). With regard to claim 8, the accelerator, retarder, thickening agent and swelling agents may be considered optional components because they are not required in the claimed composition (e.g., 0 parts). However, the presence of these optional components is further taught by Chatterji et al. in column 10, lines 12-15.

Chatterji et al. do not teach that the aerated concrete has a pore volume of at least 20% by volume or 40-85% by volume. However, Spangle teaches a lightweight cement slurry having a gas portion that comprises, by volume, about 20 percent to about 55 percent of the foamed slurry (a pore volume of at least 20% by volume; an air pore volume of 40-85%) (column 5, lines 10-13). It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made and one of ordinary skill would have been motivated to provided the aerated concrete of Chatterji et al. with the claimed pore volumes as taught by Spangle to thereby provide an aerated concrete with high pumpability.

Chatterji et al. in view of Spangle do not specifically teach that the cement has a particle distribution whereby at least 95% pass a screen with a mesh size of 32 or 64 μm . However, Kolar et al. teach that commonly known cement mixtures exhibit highest strengths at grain size up to 30 μm (finely-ground cement with a particle distribution wherein at least 95% pass a screen with a mesh size of 32 or 64 μm) (column 2, lines 19-21). It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made and one of ordinary skill would have been motivated to use cement having the claimed particle distribution in the composition of Chatterji et al. in view of Spangle as taught by Kolar et al. to provide a composition that exhibits highest strengths as taught by Kolar et al.

Allowable Subject Matter

18. Claim 2 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

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19. The following is a statement of reasons for the indication of allowable subject matter:

- (1) the prior art of record does not teach or suggest the claimed method of stabilizing gravel, sand crushed stone, rock and concrete structures which are cracked, porous or have other cavities difficult to access and sealing the same against flows of water by injecting a pumpable, low-viscosity concrete into the cavities, as a whole, especially including injecting the concrete such that existing air bubbles collapse when the aerated concrete is pressed further into the cavities such that air escaping from the air bubbles entrains the cement and the fine particulate material, if any, into the cavities to thereby cause sedimentation and hydration to take place.

Conclusion

20. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent No. 3,844,351 (Sutton et al.), U.S. Patent No. 4,058,405 (Snyder et al.), U.S. Patent No. 4,141,744 (Prior et al.), U.S. Patent No. 4,309,129 (Takahashi), U.S. Patent No. 4,340,427 (Sutton), U.S. Patent No. 5,160,540 (Johansson et al.) and U.S. Patent No. 5,728,209 (Bury et al.) have been cited of interest to show the state of the art at the time the invention was made.

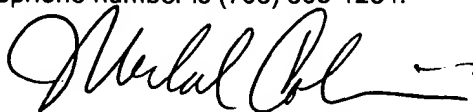
21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael I Poe whose telephone number is (703) 306-9170. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Colaianni can be reached on (703) 305-5493. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1234.



Michael Poe/mip



MICHAEL COLAIANNI
PRIMARY EXAMINER